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SCIENCE AND TECHNOLOGY

No. 155

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CONTENTS

BIOTECHNOLOGY WEEK, INTERNATIONAL BIOTECHNOLOGIES NETWORK

Paris AFP SCIENCES in French 28 Jul 83 p 42-43

[Excerpts] The Pasteur Institute and the Ministry of Industry and Research are holding a Biotechnology Week on the Paris campus of the Pasteur Institute from 5-10 September.

Activities will begin with the official launching of the "international biotechnologies network" being promoted by Great Britain and France (the scientific bureau of the organization will be in France). They will continue with the laying the cornerstone of a building dedicated to biotechnologies at the Pasteur Institute.

The program for Biotechnology week--which will be carried out under the promotional banner, "The Take-off of Biotechnology." This campaign was adopted in 1982, the initial results of which were described by the Council of Ministers on 15 June* as "very encouraging", is also to include conference discussions on various topics dealing with research and training in biotechnology and its industrial applications.

These discussions will be organized by the scientific journals BIOFUTUR and LA RECHERCHE as part of the BIOEXPO 83 exposition. This exposition, prepared with the assistance of MIDIST [Interministerial Mission on Scientific and Technical Information] and scheduled to be inaugurated on 6 September, is designed to provide a forum for French and foreign research and business firms to report on their progress and plans in the field of biotechnology.

International Biotechnologies Network

The meeting of the international steering committee for the International Biotechnologies Network, scheduled for 5 September, will bring together representatives of Japan, Canada and the European communities, in addition to France and Great Britain.

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*See AFP SCIENCES No. 361 of 16 June 1983, pp 1-2

Objectives are to be met by:

(1) establishment of a network of existing centers and centers still to be created, covering the vast field of disciplines involved in biotechnologies;

(2) encouragement of cooperative efforts in research and development in specific areas, using the COST (European Cooperation in the Field of Scientific and Technical Research) programs as a model.

The international committee, with the help of its main office, will coordinate, develop and monitor the programs proposed by national and international representatives in these fields.

Special attention will be given to the problems and needs of developing countries.

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CSO: 3698/400

BRIEFS

COMMERCIAL DEVELOPMENT OF 'FACTOR VIII'--The international biotechnological company Biogen and the Swedish company KabiVitrum have just signed an agreement for the commercial development of "Factor VIII," a protein used in the principle treatment of hemophilia A and obtained, in this case, through genetic engineering. Under the terms of this agreement, Biogen will have exclusive rights for marketing Factor VIII in the United States and Canada. For Japan, Taiwan, South Korea, Australia and New Zealand, these rights, as one knows, have been granted to the Japanese company Teijin. KabiVitrum will thus have exclusive rights for Europe and other world markets. KabiVitrum, the second (largest) Swedish pharmaceutical company (about $140 million in revenue), is mainly oriented toward biochemistry and possesses a range of hematological products which include, notably, blood plasma proteins and which are intended, in particular, for the treatment of hemorrhages and thromboses, as well as for diagnostic procedures. [Text] [Paris CHIMIE ACTUALITIES in French Feb 83 pp 5-6] 12368

CSO: 3698/390

INSTITUTE OF APPLIED ELECTRONICS TO BRIDGE UNIVERSITY-INDUSTRY GAP

Duesseldorf WIRTSCHAFTSWOCHE in German 22 Jul 83 p 106

[Text] Lower Saxony will establish the first Institute for Applied Microelectronics in the FRG. WIRTSCHAFTSWOCHE interviewed Minister of Economics Birgit Breuel on the objectives of this institution.

[WIRTSCHAFTSWOCHE] Frau Minister Breuel, Lower Saxony's Institute for Microelectronics is application oriented. Will centers of specialization be established?

[Breuel] I would like to make it clear that we are not talking about a purely Lower Saxon institute. I rather expect that the institute will expand its activities nationwide quite soon. The task concept of the institute is strongly oriented toward practice. This derives from the fact that several institutions, primarily at colleges and universities, focus their attention on basic research while big gaps--real market gaps--exist in converting research to practice. The institute will involve itself here to build bridges between basic research carried out for purely scientific reasons and the needs of the user industry.

Focal tasks to this end are planning, organization and coordination of research and development in the field of microelectronics; consultation and support in the introduction of microelectronics; selection and application of standard microelectronic components; selection and production of software, especially for standard components; the development and application of customer semispecific components; the development of electronic subsystems and systems including the selection and application of sensors and actuators. Added to these tasks is the task of basic and advanced training, primarily of employees of firms doing microelectronics work.

[WIRTSCHAFTSWOCHE] A goal of the institute is consultation on starting up in microelectronics. What is the real importance of this?

[Breuel] This will indeed be an important element of the institute's activities. The transition from mechanics to microelectronics is proving to be quite difficult, especially for small and middle-sized companies. To improve our competitive position in international markets, it is imperative that we

exploit the innovation opportunities offered by microelectronics. The institute's help will start with the creation of a climate of confidence in the efficacy of microelectronics. It will continue toward finding problem solutions in the areas of mechanical, electro-mechanical and pneumatic processes. And it will include consultation in the area of test methodology.

[WIRTSCHAFTSWOCHE] Where are you going to get the experts? Will this occasion a hassle for a headcount among the states?

[Breuel] In the end, the institute will have a staff of about 50 to 70 employees, including administrative as well as scientific personnel. The scientific area which I see as an area ripe with practical applications--demonstrable through specific activities in the field of applied microelectronics--will naturally require the application of a high standard.

The outer frame, which will be created through significant financial involvement--start-up financing only--by the state government, should be filled out by a carefully selected team of experts. Then I assume that the established task will offer sufficient challenge to attract the next generation of personnel. Thus, there will be no "hassel over a headcount" nor even targeted recruiting; of course I also believe that the task assignment, form and content of the institute offer the best attraction for outstanding personnel; also, the challenge of opening up fruitful new ground will gladly be taken up by qualified scientists.

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CSO: 3698/399

FERRANTI COMBINES LINEAR, DIGITAL FUNCTIONS ON ONE IC

Paris ELECTRONIQUE INDUSTRIELLE in French 1 Feb 83 p 37

[Text] By including Digilin networks in its catalog, Ferranti, which is distributed in France by Atac Diffusion, is offering a combination of linear and digital programmable functions on a single network without falling under the classification of hybrid circuits.

These networks are composed of cells which integrate isolated passive and active components. They include high-gain or low-current, single or double emitter NPN transistors, as well as switching capacitors and diffused resistors that are fixed or adjustable from 100 ohms to 1 Mohm. Moreover, the circuits perform predefined functions such as voltage references or regulators capable of operating in the range of 1 to 5.5 V. The Digilin series has four network families, whose complexity varies from 356 active components and 531 passive ones, to 1644 and 2660 components respectively. Each chip includes a network of cells customizable for major functions, as well as a number of cells distributed over the periphery, intended for customer-defined input/output requirements. Depending on the type of network selected and power consumption, the maximum clock frequency ranges from 250 kHz to 10 MHz.

The smallest of the networks, the ULA 1000, contains 100 principal cells, and exists in three versions. The basic version consumes 250 mW at 3 MHz, while the one designated as low-consumption requires only 25 mW, but at 250 kHz. The fastest version, LS TTL compatible, needs 330 mW to operate at 10 MHz.

Each of the cells forming the central network is composed of three transistors associated with five resistors; each chip is surrounded by 28 peripheral cells, each of which includes three double-emitter transistors, seven resistors, and a connector pad. Each of the central cells can form either a two-input NAND gate, or a three-input NOR gate, or even a two-input exclusive OR gate. The combination of any given number of cells gives access to more complex logic functions.

The largest networks, the ULA 1, 2, or 3 V000, contain 143, 256, or 280 customizable function cells, and 26, 40, or 48 peripheral cells, respectively. The central cells of these networks, optimized to operate in non-saturated logic, contain four transistors each, as well as a double source of current. The peripheral cells are also reserved for interface and analog adaptation functions. Clock frequencies vary from 440 kHz to 1.3 MHz depending on the selected consumption levels. Each of the customizable central cells is capable of forming either two NOR gates with two inputs, or a single four-input gate, or even more complex functions by combining several cells.

These circuits can be routed manually by means of a group of mylar films with elementary functions, or through a Ferranti proprietary CAD system, the ULA Designer. As soon as the logic and electrical verifications are carried out, delivery of evaluation samples can be made in 8-20 weeks; mass production can begin 10 weeks after approval of prototypes.

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BRIEFS

FRENCH SUCCESS IN COAL GASIFICATION--The French coal gasification program to make use of coal that is inaccessible to miners, has just made new strides after the success obtained on the Haute Deule site (Pas-de-Calais), the Underground Gasification Study Group (UGSG) announced on 19 July. UGSG, made up of four public organizations--the French Coal Board, Gas of France, the French Petroleum Institute and the Bureau for Geological and Mining Research--claims to have succeeded in making a connection between two boreholes 60 meters apart, in the 885-meter deep coal vein, Anne. From the surface, the technicians were able to fracture this 2-meter-thick coal vein by successively injecting water under high pressure and nitrogen foam. It now remains for them to pursue the experiment by lighting the gaseous "mixture" thus obtained underground and to recover it. UGSG emphasized that the two fracturing operations successively carried out these last days in the Pas-de-Calais northern coal basin are "the first in the world to have been successfully achieved in coal at this depth with a nitrogen foam as sand-bearing fracturing fluid, which keeps the fractures open." The public group is optimistic for the continuation of the project which should culminate in 1984 with the on-site gasification of the Anne coal vein at Haute Deule. [Text] [Paris AFP SCIENCES in French 21 Jul 83 p 31] 12368

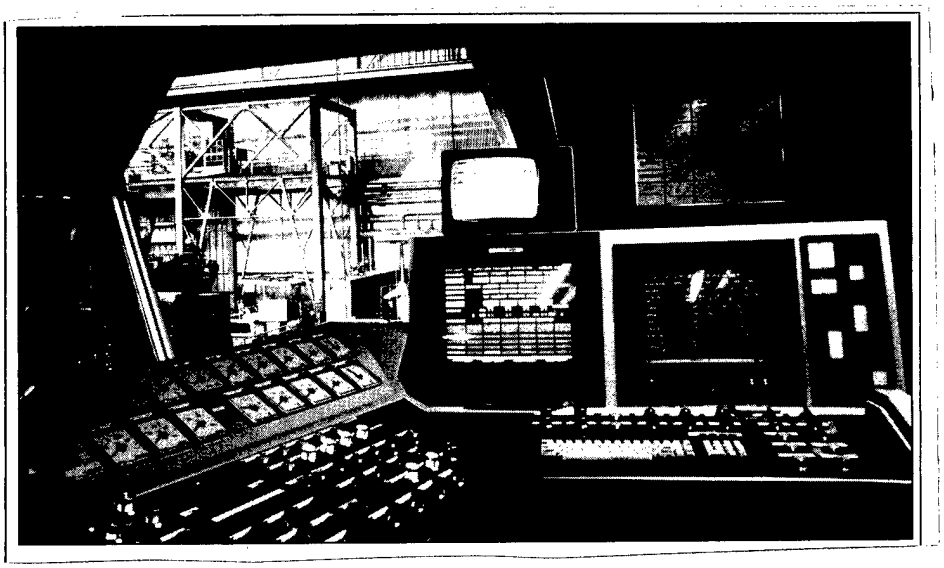
CSO: 3698/390

FRENCH AUTOMATED ROLLING MILL 'MOST MODERN' IN EUROPE

Paris LE NOUVEL ECONOMISTE in French 18 Jul 83 p 20

[Article: "The Most Modern Rolling-Mill in Europe"]

[Text] The tandem mill at the Biache plant of Usinor is now entirely piloted by four computers. All operating sequences are controlled and, if need be, altered 16 times per second. The thickness precision and flatness of the mild steel sheets that are produced at the rate of 45 km/h have improved. As a result, the number of incidents has been reduced by half and productivity increased by 30 percent. The automation of this rolling mill, the result of the collaboration between USINOR [Northern France Iron and Steel Union], IRSID (Iron and Steel Research Institute) and CEM (Electromechanics Company), is therefore turning out to be a success.



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CSO: 3698/401

PEUGEOT PURSUES EFFORTS AT FACTORY AUTOMATION

Meudon Flexible Workshop

Paris ROBOTS in French Jul-Aug 83 pp 4-6

[Article: "A World First: Inauguration of the Citroen Automated Flexible Workshop at the Meudon Plant"]

> [Text] On 9 June last, on the eve of the opening of the Fifth World Machine Tool Show, the automated flexible workshop installed at the Citroen mechanical engineering plant in Meudon was officially inaugurated.
>
> This advanced flexible workshop is the first of its kind worldwide as far as machining is concerned. It was designed and realized by Industrial Automation, the prime contractor, and the personnel of Citroen Industry.
>
> It is also a technological showcase demonstrating the know-how of PSA [Peugeot]. Finally, it represents a test in that the systems it uses could be adapted and used for other purposes, both within the PSA group and for outside clients.

Traditionally, production organization opposes the concept of "large series" with extensive automation and that of "small series" with little automation.

As a rule, transfer machines used in the first case yield high productivity rates but suffer from a certain lack of flexibility, as they are usually designed for a single part.

The characteristics of traditional machines are the opposite: they offer great flexibility because they are standardized, but their productivity is low (they are in actual operation only 10-20 percent of the time).

New economic constraints (increased competition, product diversification and decreasing product lifetime, difficulties in making sales forecasts, and the continued trend toward improved quality) prompted manufacturers to try to reconcile productivity and flexibility.

Organization in the form of an automated flexible workshop is an attempt at finding a compromise offering the flexibility of machine-tools and the productivity rate of transfer machines, either in producing medium-size series of parts of a similar type but having various dimensions, or in producing small series of complex parts.

I. Description of the Meudon Workshop

The Meudon flexible workshop was designed for the machining of prototype mechanical parts used to develop new models (cylinder heads, crankcases, transmission cases, etc.; series ranging from 20 to 80).

The workshop is managed in real time by a computer and is organized around two machining centers which are served by a fully automated system.

Thanks to its flexibility, it can machine in any order any part that will fit in a 50-mm edge cube.

Its productivity is the result of four major factors:

- automation: once a part has been introduced into the system, it is machined, washed and checked with minimal human intervention. There remain only a few manual work stations: tool pre-adjustment, loading, turning over of parts, and examination of doubtful cases.

- improvement of the quality level through the introduction of a series of systematic computerized inspections: the pallets, rough parts, tools, fluids, machining sequences and programs of the machines are inspected, as are all operations and operation sequences.

- the increased time of actual use of the machines: 75-80 percent in three 8-hour shifts.

- the reduction of the number of parts being processed at a given time and of the equipment they require (pallets, tools, etc.).

A. The Machines

All the machines installed at Meudon are French. The workshop consists of:

- two 5-axis palletizable numerical control machining centers with two 50-tool magazines and automatic tool loaders;

- one machine for the surface treatment of parts including a robot, to clean the parts prior to measuring them;

- one three-dimension measuring machine with a computer and an automatic sensor-changer, to check machining operations and prepare one inspection sheet per part;

- one central automated tool magazine for 600 tools (maximum weight of each tool: 25 kg);

- one tool-measuring machine recording the dimensions of tools before they are introduced into the tool magazine, and sending these dimensions to the central computer so it can determine what corrections should be made during machining;

- one system of four wire-guided carts for the automatic handling of part-pallet and tool-pallet assemblies;

- seven automatic loading/unloading stations for part pallets;

- four automatic loading/unloading stations for tool pallets;

- six manual work stations: loading, unloading and pallet return, etc.;

- one air-conditioned control room where data-processing equipment is located.

B. The Computer-System Architecture

The workshop is managed in real time by data-processing equipment organized according to a three-level hierarchy:

- the computer-assisted design and manufacture system which designs and produces machining sequences and programs;

- the centralized workshop pilot system consisting of two computers and peripherals;

- local systems piloting the machines and storing and handling equipment:

. two numerical controls for the machining centers, each assisted by two programmable controllers;

. one microcomputer for the robot of the surface treatment machine;

. one microcomputer to pilot the three-dimension measuring machine;

. one programmable controller to pilot the part-pallet storage subsystem;

. one programmable controller to pilot the central tool-magazine subsystem;

. one microcomputer, which is connected to the above controller, for the tool-measuring machine, and one dialogue console through which the operator can supervise the tool inventory and access it when a tool is needed;

. one central programmable controller managing the four microcomputers that equip the four wire-guided carts;

. consoles or workshop terminals at the loading/unloading, turning over and doubtful-parts stations.

II. Operation of the Automated Flexible Workshop

A. The Data-Processing System

The "brain" of the workshop, it has a triple function:

- coordination of subsystem operation and production management;

- detection and correction of anomalies;

- dialogue with the terminals that are directly connected to it.

B. Parts Management

The objective is to comply with machining priorities while providing the maximum rate of utilization of the machining centers.

After the pallets, tools, machining and inspection sequence and programs have been introduced into the system, the rough parts can be introduced. They are machined one at a time, the parts waiting to be processed being stored in the central part-pallet store. After machining, the parts are washed and inspected, and then routed to the unloading station.

C. Tools Management

It has a fourfold objective:

- to provide wide tool availability;

- to reduce the number of tools required to operate the workshop;

- to ensure that worn-out tools are replaced;

- to supply tools to the machining centers in masked time, without interrupting the machining operation.

Prior to any machining operation, the computer checks the availability of tools and the compatibility between their potential lifetime and machining time.

After each machining operation, the central computer updates the potential lifetime of tools. The tools that are not required for subsequent machining operations are automatically returned to the central magazine.

III. Man's Part

The Meudon automated flexible workshop operates in three 8-hour shifts (two day shifts, one night shift) representing a total of 26 people.

In addition to the engineer in charge of the workshop, six people are taking care of programming, three of preparing the plates, two of adjusting the tools, three of loading, unloading and turning over the parts, two of inspecting

doubtful parts, four of maintaining machines, two of inspecting parts, and three of piloting the equipment.

In a Meudon-type automated flexible workshop:

- skilled workers represent 38.5 percent of all the personnel;

- the number of technicians shows a considerable increase (57.6 percent have a technician or higher-technician diploma);

- the supervisory personnel remains the same (3.9 percent).

IV. Economic Balance

- The total cost of studies and investments in the Meudon automated flexible workshop (including operating environment and civil engineering work) amounted to 46 million francs in 1983, including 28 percent for studies.

The total amount of investments required for a traditional workshop with a similar production capacity is estimated at 49 million francs.

- A Meudon-type automated flexible workshop operating with three machining centers will become profitable to operate after 3.2 years, compared with 4.8 years for a traditional workshop.

- In the future, construction of an automated flexible workshop similar to the one in Meudon will cost approximately 18 percent less, as the cost of studies will be less.

In the future, the basic layout of the Meudon workshop could be used to design automated flexible systems that would meet different manufacturing requirements.

Some Figures on Automation

Paris ROBOTS in French Jul-Aug 83 pp 6-7

[Article: "A Few Figures on 'Productique' at the PSA [Peugeot] Group"]

[Text] 'Productique' [factory automation] is the integration of the new technologies derived from microelectronics into basic technological systems (presses, machine-tools, etc.); these new technologies include:

- computer-assisted design and manufacture (CAD/CAM);

- robotics;

- industrial data processing.

PSA possesses considerable capabilities in each of these three domains:

I. Computer-Assisted Design and Manufacture (CAD/CAM)

From 1977, when the first all-purpose systems were developed on the French market, to 1983, the number of CAD/CAM systems used by the PSA group increased fivefold.

The 35 systems which the group now uses are equipped with a total of some 100 graphics screens and 12 very large drawing tables. They are installed:

- in the product engineering departments at La Garenne, Velizy, Carrieres-sous-Poissy and Whitley for the automobile companies, and in Beaulieu, Fourchambault and Cambray for Peugeot Cycles and the Gear and Reduction Gear Company;

- in the procedures departments of the group where the sequence and design of production tools (casting, forging, stamping), as well as special machines and robots are studied;

- in the building-engineering departments;

- in manufacturing, where numerical controls are used to realize the shapes and means used in production and inspection (machines, computers, prototypes, etc.).

II. Robotics

The PSA group owns a total of close to 12,000 robots which are installed at its various subsidiaries.

Close to 300 of these robots are type-D (learning) robots: manipulators that can be programmed by recording movements controlled in the manual mode and can then repeat the movements thus learned. They include the following:

- Spot-welding robots	185
- Arc-welding robots	28
- "Coating" robots (lacquer, adhesive, mastic)	20
- Foundry handling-robots	15
- Rough-casting deburring robots	4
- Forge handling-robot	1
- Miscellaneous robots: - machine-tool servicing - sheetmetal handling	23
- Laboratory robots	3
- Remote-controlled robots handling heavy foundry loads	6
Total	285

A Few Applications

A. Spot-Welding Robots

- the 205 line at the sheetmetal workshop of the Peugeot plant in Mulhouse;

- the Semba underbody line at the Talbot plant in Poissy, which is equipped with Barnabe robots;

- the Visa line at the sheetmetal workshop of the Citroen plant in Rennes, which is fully automated and requires no manual operation.

B. Arc-Welding Robots

- the arc-welding robots at the Citroen plant in Caen are integrated into fully metallized iron-work facilities and produce front and real axles;

- the arc-welding robots at the Peugeot plant in Mulhouse are carrying out repetitive welding tasks on the 305 and 205 engine cradles.

C. "Coating" Robots

They are found at the Citroen plants at Aulnay and Rennes and at the Peugeot plants at Sochaux and Mulhouse.

D. Manipulators

- the "cylinder-head" manipulator robot at the Citroen foundry plant in Charleville extracts parts from the molds and unloads them on a finishing transfer system after which they are automatically separated and cleaned of sand;

- the stamping workshop at the Peugeot plant in Mulhouse includes three lines of presses (four to five presses per line) equipped with loading manipulators and managed by programmable controllers. No human intervention is required during the whole operating sequence;

- at the plants of the North Automobile Mechanics Company in Valenciennes and the East Automobile Mechanics Company in Tremery, special machines are equipped with appropriate manipulators that assemble respectively transmission and engine components.

E. And the Others...

- in the metrology laboratories of the East Automobile Mechanics Company in Tremery and the North Automobile Mechanics Company in Valenciennes, three-dimension measuring robots carry out high precision measurements;

- on the Belgian-block type test road of the Peugeot testing center in Belchaux, control robots are used to test vehicle endurance without having to use a driver.

Finally, we should mention that, at the Robotics and Automation Experiment Center (CERA), the PSA group is carrying out tests on robots designed for assembly operations.

III. Industrial Data Processing

Extent of the PSA computer base:

Type of Equipment	Peugeot Automobiles	Citroen Automobiles	Other Companies	PSA Total
Mini and microcomputers	238	92	60	390
Programmable controllers	376	211	483	1,070

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ASEA'S 'MOST AMBITIOUS SINGLE PROJECT,' FUTURE PLANS DISCUSSED

Oslo AFTENPOSTEN in Norwegian 11 Aug 83 p 27

[Article by Knut Lovstuhagen]

[Text] "An investment in the future of far-reaching importance for large parts of the concern." That was ASEA [Swedish General Electric Corporation] general director Percy Barnevik's description of the latest product from the century-old firm in Vasteras: a data system for process coordination and monitoring that in terms of capital investment and engineering work represents ASEA's most ambitious single project to date. It has cost around 200 million kroner to develop ASEA Master, as it is called, and something like 500 man-labor years have gone in on pure engineering work.

It is already clear that this new system for coordinating and monitoring processes will be used in connection with the Norwegian oil activity in the North Sea. Equipment worth a total of around 20 million kroner has been ordered for the two platforms, Gullfaks and Heimdal. ASEA estimates that it will sell 300 million kroner's worth of ASEA Masters this year and that sales will double by 1987.

With ASEA Master, the big Swedish concern is competing with all established suppliers of process coordination and monitoring equipment. In the past, however, different equipment with different data languages, documentation and auxiliary equipment has been used in parallel, without any communication being possible among the different coordination and monitoring assignments. ASEA Master covers all the functions involved in a single systems concept. And in the programming, they are operating with established concepts and terms that are well-known to engineers, so that they do not have to be computer specialists in order to use the equipment.

With the forthcoming marketing effort in mind, there must now be an enormous build-up of the electronics side in the concern's subsidiaries. This is also true in Norway, where there will be around 50 employees in this field by the end of 1987 in ASEA-Per Kure, Inc.

More Business in Norway

Incidentally, ASEA's subsidiary in Norway has become the center for the concern's offshore-directed activities around the entire world. "From Norway we will 'attack' the North Sea, the Gulf and other areas where there is offshore oil activity," said general director Barnevik. "We cannot always count on sitting in Sweden and directing our activities by remote control; we have to establish ourselves as close as possible to the various markets. For this reason our Norwegian subsidiary has been given responsibility for our concern's offshore-oriented involvement on a worldwide basis. We have plans to set up more business in Norway, but it is too early to discuss in more detail what we are thinking about in that connection. Not too long ago we tried to buy up a Norwegian firm, but that did not work out. But there are other possibilities that we have to look at more closely."

At one time ASEA tried to buy up the bankrupt Glamox firm in Molde, but was unable to complete the deal. AFTENPOSTEN has heard that discussions are now under way with another Norwegian firm that could be taken over. But the results of these talks will probably not be known until some time in the future.

Earlier this year, general director Barnevik was able to present solid figures for last year. Orders received increased by a good 50 percent for a value of close to 27 billion Swedish kronor, while profits were over 1.5 billion Swedish kronor, an increase of 72 percent compared to the previous year. The ASEA group includes the parent company, ASEA, Inc. and around 170 subsidiaries in 37 countries. More than 56,000 people in all work for the concern, 36,000 of them in Sweden. Sales outside Sweden amounted to 68 percent of the total, while in 1981 they amounted to 61 percent. In the last half of the 1980's, this figure is expected to rise to 75-80 percent, according to Barnevik. The technology areas that will experience the greatest development in the next 10 to 20 years are energy technology and electronics.

In connection with the 100-year anniversary, general director Barnevik--in the book, "Technology in ASEA"--revealed how he thought ASEA would develop. He expects that the years leading up to the turn of the century will be a challenge with a probably sharply varying and generally low growth in international economy. If ASEA can continue to show aggressiveness, a sense of purpose, selectivity and above all the capacity to adapt itself, he thinks that the concern will still be a big one in its branch and one of its technical leaders in the 1990's.

"We will be more of an electronics firm than we are today, with perhaps 12-15,000 people employed in the electronics area. A substantial part of the electronics effort will involve application in the area of generation, transfer and consumption of electricity. Industrial automation and means of transport will be big commercial areas for ASEA," Barnevik said.

The concern will be considerably larger than it is today, but with a more international structure. Toward the end of the century, only 15-20 percent of sales will occur in Sweden, a good 50 percent in industrial countries outside Sweden and around 30 percent in what are now called developing and state trade nations. The concern will be traded on the stock exchanges of several countries and will have financed its expansion in part in the United States on the New York Stock Exchange.

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CSO: 3698/397

SCIENCE POLICY

AGREEMENT WITH SWEDEN ENVISIONS TECHNOLOGY TRANSFER

Athens I KATHIMERINI in Greek 24 Aug 83 p 7

/Text/ A cooperation agreement between ELEVME /Greek Industrial and Mining Investments Company/ and the Swedish firm ELECTRO-INVEST was signed in Athens yesterday for the establishment of a Greek company to be called Greek-Scandinavian Industrial Investments Company (ESEVE).

Speaking to representatives of the press, Mr St. Angelopoulos, ELEVME business adviser, said the following:

The new company will operate in accordance with Greek laws and will have as its purpose research, manufacture and operation of industrial units that are of direct interest to Greece.

Preference will be given to the financing of projects that would permit high technology transfer to the country. These investments will include industrial installations involved in the development of and research on natural resources, energy production projects and other related projects.

ESEVE will also have the possibility to sell products of these Greek investments on both the Greek and international markets.

Mr Angelopoulos said, "Through this form of Greek-Swedish cooperation, ESEVE will benefit from the world-renowned Swedish technology and its special technical capabilities. Part of the production from these investments will be exported to Sweden and other countries. The new company will contribute to the industrialized development of Greece by utilizing existing natural resources."

ESEVE's capital stock is 20 million drachmas, 60 percent of which belongs to ELEVME and 40 percent to the Swedish ELECTRO-INVEST. The latter is part of the Swedish ASEA group that was formed in 1929 and has from the very outset been actively engaged as a manufacturing and commercial company in Sweden and abroad. It is specialized in delivering finished goods for the operation of energy producing plants, water and waste water processing plants, electric power distribution nets and industrial installations.

ELEVME is the principal shareholder of an industrial group, the most important of which are: Mesolongion Salt Mines Company, ELSI /Greek Ferroalloys/ Company, Petrochemicals of Greece Company, Lavrion Mining Company and Skoumtsa Chromite Mines.

ELEVME's shareholders are: the National Bank of Greece, ETVA /Hellenic Industrial Development Bank/, Land Bank of Greece and ETEVA /National Investment Bank for Industrial Development/.

5671
CSO: 3698/403

EEC TO IMPLEMENT FOUR-YEAR RESEARCH PROGRAM IN 1984

Paris AFP SCIENCES in French 30 Jun 83 p 1

[Text] On 28 June the Ten reached the decision in principle to implement a broad 4-year research program in 1984. This was learned from community sources, according to the Council of Research Ministers of the European Economic Community in Luxembourg.

Nevertheless the Council was unable to pass the budget required for the implementation of this program which will cover seven main areas: agriculture, energy, natural resources, aid to developing countries, industrial competitiveness and raising the technological and scientific potential.

In fact, taking into account the negotiations decided on by the Stuttgard European summit on the EEC financing reform, which in principle should be completed during the month of December, the ministers were unwilling to commit themselves to a budget of 3.7 billion ECUs (3.3 billion dollars), proposed by the European Community for the 4 years.

At the request of the French minister, Mr Laurent Fabius, it was also made clear that "the planning and adoption of the programs will take budget restrictions into account."

The president of the Council, the West German minister Heinz Riesenhuber, expressed the view that this outline program marked an "important step" in cooperation between the EEC states, the European Community and the dynamic forces of the economy.

Moreover, the Council warmly welcomed the ESPRIT [European Strategic Programs for Research and Development in Information Technology] program proposed by the Community according to Community sources. This 10 year program which is to start at the beginning of 1984, is designed to promote the European data processing and microprocessing industry and enable it to catch up to the United States and Japan.

But the ministers who are expected to decide on this program next October were unable to make a commitment on the total appropriation of 1.5 billion ECUs (1.35 billion dollars) set by the Community for the first 5 years, of which one half is to be financed by the EEC and the other half by European industry.

However, the Council recognized the need to increase the EEC research budget, which at present is approximately 600 million ECUs per annum.

12309
CSO: 3698/374

SCIENCE POLICY

EEC SETS UP COMMITTEE ON SCIENCE, TECHNOLOGY

Paris AFP SCIENCES in French 6 Jul 83 p 1

[Text] The European science and technology development committee (CODEST) which is to assist in coordinating European projects in the research matters, has just been set up in Brussels. CODEST has 21 representatives from the 10 EEC countries and is chaired by Mr Umberto Colombo (Italy). Messrs Ilya Prigogine (Belgium), Nobel prize winner in chemistry, and Hubert Curien (France), president of the European Space Agency (ESA), hold the posts of vice-president.

CODEST is to immediately participate with the European Committee in an experimental 2-year project designed to promote the effectiveness of the EEC's scientific potential. As Mr Colombo stressed on 5 July in Brussels at a press conference, the EEC's non-military research budget in 1982 amounted to 52 billion ECUs (46 billion dollars) or twice as much as that of Japan and a little less than that of the United States. The objective is to see to it that the national research programs are regrouped in order to avoid a waste of human and financial resources.

CODEST shall define which types of research have priority for the EEC. Initially, the EEC projects to promote research shall cover seven areas:

Pharmacobiology: application of new developments in cellular and molecular biology;

Physics of solids: phenomena of structuralization and production processes for composite materials;

Optics: application of modern techniques in mathematical analyses to different problems in optics;

Combustion: investigation of phenomena in ignition (development of substances during combustion);

Photometry-photoacoustics: application of non-destructive analysis.

Climatology: transitory phenomena;

Interface phenomena.

The means for implementation and procedures for promoting research in the framework of the 1984-87 research program--which the European Committee propose the Ten approve and which is primarily aimed at improving the competitiveness of European industry and agriculture will be based on the results of this experimental project.

12309
CSO: 3698/374

SCIENCE POLICY

FRENCH INDUSTRIAL MODERNIZATION PLAN TAKES SHAPE

Paris AFP SCIENCES in French 3 Jun 83 pp 2-3

[Text] Preparation of the Ninth Plan continues: The "Commission for the Development of Productive Activities" has just completed its report on the second phase of its studies which includes 23 recommendations to encourage initiative in those companies favoring group modernization.

"If industry does not modernize more rapidly between now and 1986, any prospect of a recovery benefiting employment will be blocked by a serious deterioration in foreign trade as occurred in 1981 and 1982", the advisory working commission chaired by Mr Richard Armand, general manager of CIT-Alcatel observed. The commission therefore lists general conditions before formulating specific sectoral recommendations.

In particular, it notes that in order to modernize, companies must be able to raise sufficient financial resources. It comes out in favor of decontrolling the price of products exposed to competition, and above all, of "stabilizing or even reducing" compulsory deductions when the plan begins.

"In certain sectors, it can even be said that the most urgent step is to loosen the financial constraints which stifle companies that are otherwise willing and able to modernize," it reports.

This would involve "a careful comparison of costs and tariffs which burden companies in different parts of the world and the taxation of certain social contributions."

The commission therefore recommends that two three-member groups be set up: the one to study this issue and the other, the channeling of savings toward industry.

For, in its opinion, modernization proceeds from "an increased savings effort on the part of households and a sustained flow of the least costly savings resources to promote the spread of new technology in industrial firms, from the outset of the Ninth Plan." In the same vein, the commission welcomes the creation of a savings plan to finance an industrial modernization fund.

Job training is another widely developed theme. "Investment, in a time of rapid technological change, will not benefit companies unless it is accompanied by an equal effort to upgrade skills and to transform organizational structures of labor."

The commission cites two studies that show the need to adapt the skills of two out of every three salaried workers in industry over the coming decade and the need to extend job training efforts to approximately 3 percent of all salaried employees (against the current 1.8 percent).

Recommendations of a more sectoral nature follow next. In new technology industries, "considerable efforts in investment and in research and development" are needed. In particular, the commission hopes to facilitate the creation of expansion of medium-sized firms "by organizing a judicious use of sub-contracting." In electronics, data processing and office automation, "the expansion of French groups requires an international strategy which could involve licensing or partnership agreements with European, Japanese or American manufacturers."

"Through automation, the manufacturing industries--generally thought of as labor-oriented--are becoming more and more capital-oriented," the commission also noted.

It estimates that the development of automation could lead to a 20-40 percent reduction in manufacturing costs in textiles-apparel, shoes and woodworking In order to catch up to our principal competitors, we will have to double or even triple investment in the manufacturing industries (from 2 to 4 percent of current revenues).

For public works and housing, it favors an "emergency plan that would have to be drawn up in conjunction with commitments from the sector's participants to coordinate the modernization of the production apparatus." The goal of meeting social housing needs (...) means settling a level of activity not noticably far from 400,000 homes a year."

The recovery of basic industries involves an European plan to develop production capacities and "a common policy among European countries" on raw material and energy prices. In order for companies to reach a state of equilibrium by the end of the plan, "bridges" between upstream and downstream industries will have to be established and job training, research and commercial investment efforts increased."

In conclusion, the commission--whose findings do not necessarily imply government approval or action--recommends that one or two "modernization indicators" be instituted so that action undertaken during the plan may be followed up.

12413
CSO: 3698/373

'VENTURE 83' TO BRING POTENTIAL INNOVATORS, INVESTORS TOGETHER

Duesseldorf VDI NACHRICHTEN in German 22 Jul 83 p 1

[Article: "Risk Capital for Aggressive Innovation Starters"]

Imaginative business founders who are expected to keep the German economy competitive through innovative products need more risk capital. To bring potential business starters and investors together, the symposium "Venture 83" will be held on 6-7 October in Munich. Here, according to a press statement on 6 July by Dr Alfred Prommer, one of the initiators, experienced professionals will speak. Furthermore, ways will be shown how risk capital can help "to turn innovations into marketable products; and the areas of opportunities as well as risks for the founders and investors will be pointed out," Prommer added.

In German financial circles a new buzz word has been making the rounds for the past year or so--"risk capital." Or, as the proponents of this new method for financing young technology companies would rather hear it said, "venture capital." Which shows that also this concept is an adaptation from the United States. Under the venture capital mechanism, investors such as life insurance companies, industrial firms, banks and private individuals make a small portion of their capital available--typically: one promille-through foundations which specialize in financing newly founded, technically innovative companies. The foundations then continuously monitor the development of these young firms in which they have a capital investment using critical, competent business experts to prevent losses on nonprofitable projects. Naturally, the venture capital investment is expected to be profitable when averaged over all projects.

At the press conference in Munich, also the advisor to the EG [European Communities] Commission for Investment Financing stressed that venture capital is "critically important for the renewal cycle of the industrial landscape," especially in the years following the immense loss of purchasing power due to the tenfold increase in the price of oil; it is now "imperative that the required capital for futuristic innovations" be mobilized. However, this capital has to be raised not in the form of credit but as "risk-bearing, participation capital." Now that the innovative power of small, young companies has been clearly recognized and they are being funded with risk capital in the United States, there exists for the FRG the danger of a competitive set-back if more young, futuristic companies are not soon set in motion here.

9160
CSO: 3698/399

SCIENCE POLICY

INDUSTRIAL MODERNIZATION FUNDING PLAN TO BEGIN IN SEPTEMBER

Paris AFP SCIENCES in French 28 Jul 83 pp 7-7a

[Text] The Industrial Modernization Fund (FIM), which is supposed to attract a portion of French savings to industry, will finally go into operation on 1 September, according to a 28 July announcement by Mr Laurent Fabius, Minister of Industry and Research.

This fund, Mr Fabius told the press, should contribute "at least" Fr 5 billion to industrial modernization each year from now on. The fund has received a start-up endownment of Fr 3 billion from the Deposit and Consignment Office (CDC).

Once in full operation, the FIM must get its capital from the public by means of a novel savings instrument, the industrial development account (CODEVI). This industrial savings instrument will see the light of day sometime in October. According to Mr Fabius, it will be designed to work "as much as possible" like an ordinary savings pass-book.

Like pass-book accounts, the CODEVI will be tax-exempt and deposits will be limited--in this case to Fr 20,000. Similarly, the amounts collected will go to the CDC before being transferred to the FIM.

According to the Ministry of Economic and Financial Affairs, accounts will have the same interest rate as "A" savings accounts (8.5 percent currently, 7.5 percent beginning 1 August). But specific regulations governing utilization by the public are still to be defined (rate of deposits and withdrawals,...).

The FIM will be under the National Agency for the Evaluation of Research (ANVAR), which already administers most mechanisms that have been set up as incentives to innovation.

Assistance will take the form of participative loans, with highest priority going to firms engaged in the construction of high technology equipment or those intending to do so. Loans will also be provided to rental-purchase businesses in order to improve the terms offered for this equipment.

Mr Fabius said that in responding to business the fund's watchwords will be "simplicity" and "speed".

In making their proposals, firms will only need to deal with a single examiner, ANVAR, which examines each application and decides what action to take. Nevertheless, decisions on the most important applications will be made by the president of the fund, the Minister of Industry.

In addition, firms are guaranteed that a decision on their application will be made within 8 weeks of filing.

The participative loans granted by the FIM may be for a period of up to 10 years with up to a 2-year grace period. Set up by the banks, the loans will bear 9.75 percent interest under current market conditions.

Mr Fabius said that FIM's priorities will be as follows:

--installations of high technology equipment in business;

--development of office automation and memory cards;

--biotechnology;

--micro-computers for use in education and training;

--development of energy-efficient vehicles.

Finally, loans of more than Fr 150 million will be guaranteed directly by the state, while those of lower amounts will be guaranteed through an ANVAR reserve fund.

9516
CSO: 3698/400

ATR 42 PROGRAM VIEWED AS GOOD OPPORTUNITY FOR SNIAS

Paris L'USINE NOUVELLE in French 19 May 83 pp 94-95

[Article by Patrick Piernaz: "ATR 42: A Whiff of Oxygen for SNIAS?"]

> [Text] Is SNIAS about to give us a replay of its Airbus coup with turboprop regional transports? Demand for this type of aircraft is estimated at 2,000 by 1990. All SNIAS has to do to win is to build a better airplane than the competition.

Will SNIAS, in association with Aeritalia, succeed in capturing close to 25 percent of the market for 20- to 50-passenger propeller-driven aircraft, plus 20 percent of the market for the bigger (50 to 70-passenger) planes? We'll know the answer to that in 1985, when the first of the new planes come off the assembly line at Toulouse. What SNIAS is shooting for is a repeat performance, on a smaller scale, of its Airbus coup by breaking into the very promising "commuter" carrier market, serving regional passenger routes over distances averaging 400 to 500 km.

The French builder is relying on a detailed market survey involving more than 100 airlines, whose people told it what specific types of aircraft, with what particular features, they would be shopping for in the future. Gone are the days when the almighty design shop had a free hand to come up with a dream aircraft, to the despair of the marketing people who found it a nightmare to sell. This particular survey reveals a potential requirement for 2,000 aircraft with 20 to 50 seats by the end of the 1990's. That market, the survey says, will be split among North America (31 percent), Europe (20 percent), and the rest of the world (49 percent).

The SNIAS-Aeritalia group believes it will be able to sell 450 to 550 of its new models on this market. That is an ambitious goal, but not unrealistic. In fact, the order books are filling up at a nice, steady pace. With the first delivery date still 2 years away, 13 airlines have already ordered a total of 60 planes (45 firm orders and 15 options).

That does not mean, however, that the ballgame is over. Jean Martre, who will take over from Jacques Mitterrand as CEO at SNIAS, can tell you that. The Toulouse company is moving into a market already occupied by such foreign builders as De Havilland-Canada, Saab-Fairchild, Embraer, and Casa-Nurtanio,

who have also been talking up their new regional aircraft to the airlines, and theirs will hit the market before the ATR 42 can. The Netherlands' Fokker, which has already sold 752 of its F-27's to 160 customers, is now at work on an updated version of that plane.

The way things stand, the only solution open to the French builders and their Italian partner is to hit the market with a more competitive plane, which is just what they did with the Airbus. The Franco-Italian group is relying heavily on its vast design capacity, far beyond anything the competition can command. The partners deliberately chose to take whatever time it takes to get the aerodynamics and lightness factors perfect--and that is a domain in which Aeritalia is past master; it currently produces a number of composite-materials parts for the Boeing 767.

Result: The ATR 42 can offer, according to SNIAS, a direct cost per plane that is 30 percent lower than such older-generation aircraft as the DHC 7 or the F-27, and 10 percent cheaper than such current-generation equipment as the DHC 8 or Casa-Nurtanio's CN 235. Furthermore, the ATR 42 will offer acoustical comfort very close to that afforded by the jet aircraft, since noise in the passenger cabin will be lower than 80 dB at the propeller level, thanks to some astute technical solutions: distancing the engines, spacing the stringers closer together in the fuselage, selecting a low spin-rate (1,066 rpm/tr/min at cruising speed), and adopting a synchrophase system between the two propellers. The ATR 42 will also be endowed with an ultramodern cockpit, similar to that in the A 310.

That's a lot of trumps to hold, but none too many to insure the commercial success of this aircraft, since the industrial stakes turn out to be considerably higher than early estimates had set them. Because, while in economic terms, the ATR 42 will not even weigh a tenth as much as the Airbus did, you must bear in mind that SNIAS is handling 50 percent of the work on this plane, as against only 38 percent on the Airbus. There are in fact already 2,000 people working on the ATR 42 program--4,700 if you count the supply contractors.

Another important point: The startup of the production line will coincide with the crest of the Airbus manufacturing wave, as only 17 Airbuses were ordered in 1982. The backlog of 130 still to be built will guarantee the work-load until mid-1985. But, once past that the pace of the five A 300 and A 310's will be maintained. And that is the very time when production is timed to begin on the ATR 42, at the rate of four planes per month.

Clearly, the ATR 42, priced at $6 million, could well prove an invigorating lungful of oxygen to the French company and prove its backers right in their battle within the top hierarchy to overcome opposition to the cost of developing the program (1.5 billion francs, split evenly between the partners). Their satisfaction must be shared by the principal subcontractors: Hamilton standard (propellers), Messier-Hispano (landing gear), Garrett (air conditioning), Auxilec (power generators), Softair (pressurization), Goodyear (brakes and wheels), Bronzavia (fuel circuits), Kleber-Colombe (de-icing system), King (radio communications), etc.

It is worth noting, too, that other suppliers, not chosen for the preproduction run, might well be in on the full-production operation. They include Turbomeca, which is considering supplying engines in cooperation with Rolls Royce, and SFENA, which is now at work on the design of a French avionics system (the current system is supplied by Sperry) in collaboration with Thomson, Jaeger, and Crouzet.

During this period, there is a chance that a stretched version of the ATR 42, known as the ATR X, will be developed. That particular model, whose future is pegged to the way the market behaves, might be available in two versions: a 60-64-place model powered by an improved Pratt & Whitney 120 engine, or a 70-72 place version with modified wings and a new engine--either the Pratt & Whitney PW 100-13 or the Rolls Royce-Turbomeca engine.

Sharing the Work

In the ATR program, the primary industrial responsibilities of the two partners will be shared as follows:

Aerospatiale will build the wings at Saint-Nazaire, handle the final assembly of the ATR 42, outfit the cockpit, install the propulsion units, and run the test flights at Toulouse.

Aeritalia's chores will be to build the complete fuselage, including the entire after-assembly, in its plant at Pomigliano d'Arco, near Naples.

6182
CSO: 3698/375

NEW SNIAS HEAD COMMENTS ON AIRBUS PROGRAM, COOPERATION

Paris LE MONDE in French 14 Jun 83 p 42

[Interview with SNIAS CEO Jean Martre, by James Sarazin, place and date not specified]

> [Text] The new CEO of the nation's aerospace company will be facing a touchy situation in his new job, when Jean Martre takes over from Gen Jacques Mitterrand. The company's financial situation has been going downhill for a year (LE MONDE, 21 May), and slackening sales of the Airbus--which accounts for 65 percent of the work in hand at the Aircraft Division of SNIAS--have more than a little to do with it. In an interview, Mr Martre explained the reasons why he thinks, in spite of the economy, that SNIAS must push ahead in developing and selling aircraft of the Airbus family. "We are," he said, "in a perilous race where you've got to have wind to spare." Even so, resolute though it may be, competition does not rule out prudence, and, from the angle, industrial cooperation and a good balance between civilian and military activities look to him like reliable support in limiting the risks inherent in running a company like SNIAS.

[Question] The expected speedup in production of the Airbus is not so rapid as anticipated, owing to the slump in civil aircraft sales. What impact will this have on SNIAS' work in hand?

[Answer] We were, in fact, planning to produce Airbuses at the rate of 8 or even 10 a month. Considering the sluggishness of the civilian aviation market, we have had to hold production down to around five aircraft per month. That pace had not yet been outstripped at the "downstream" and assembly-line levels. At that point, there will be at most a holding operation, but no slowdown.

On the other side of the coin, since the production cycle of an aircraft is 36 months, in the upstream processes--especially when they involve subcontractors--the pace had already been stepped up so as to be able, when the time came, to turn out more than five a month. So you see, upstream we have a buildup, which we are going to have to absorb by cutting back substantially on deliveries from suppliers.

Some of SNIAS' own plants, as subcontractors, will be affected by the cutbacks. Our company is now completing plans to avoid any real labor trauma.

[Question] According to your predecessor, Gen Jacques Mitterrand, the Airbus' poor sales performance could be attributed in part to the financing you offered prospective buyers, which, according to him, were not even marginally competitive with the packages the Americans could offer.

[Answer] In the civil aviation market, it is imperative that you have competitive financing systems. So our goal is to develop such a package. The situation has taken a turn for the better over the last few months; we are on the right track, but it's going to be a long-term proposition.

[Question] Considering the stagnating state of aircraft sales, do you think the Airbus program has any chance of moving into the black?

[Answer] From the company's point of view, it is already showing a profit. From the point of view of the government, which advanced the money for its development, it's not profitable yet. The funds advanced have not yet been repaid in full, and we shall doubtless have to produce a few hundred more planes to do that.

[Question] A few hundred? Could you be more specific?

[Answer] The fact is that the profitability threshold will depend on several factors: the rate of sales, the pace of production, the price level--largely determined by the competition--and above all by the exchange rates.

[Question] Isn't the present multiplicity of models offered--Airbus A-300 and A-310--prejudicial to the profitability of the program?

[Answer] Insofar as production goes, maybe. The capacity to amortize the fixed costs of development is reduced by the multiplication of models; no question about it: that's one of our problems. But, marketwise, a company must adapt to the needs of its customers and to the shape of the competition. Yes, we did develop these versions, and if we plan to develop a lot more, it's because we have to. The race, in the transport plane business, is a tough and dangerous one. Now is certainly no time, after the efforts we have put into it, and after the success we have achieved, to throw up our hands and abandon the market to the competition. In a race like this one, what you need most is good wind.

Sharing the Risks

[Question] If the Airbus Industries venture were to take in other partners to build the 150-passenger A-320, wouldn't that be detrimental to the interests of SNIAS, among others?

[Answer] As of right now, the risk-sharing package for the A-320 program has already been worked out among the existing partners. Should other partners come in, it will of course be necessary to rework the shares. I don't, however, believe that such a redistribution would be prejudicial to SNIAS. Besides, we

haven't had any nibbles thus far from a new partner who would be in a position to shoulder any sizable share of the burden.

On the other hand, new partners would also mean more money to work with. Given the difficulties of financing any program of this scope, we would welcome associates who would allow us to get a quicker and smoother start.

[Question] In addition to its involvement in Airbus Industries, SNIAS is committed to build a "regional" transport aircraft, the ATR 42, which will carry 42 to 49 passengers. That aircraft, too, will be built in collaboration with a foreign builder, Italy's Aeritalia. Doesn't this increasing shift to cooperative ventures give you pause over losing some of your independence?

[Answer] No. As we see it, the essential point of cooperative ventures is to spread the risks. Technically speaking, we are quite capable of building the products we have in mind all by ourselves. Development, though, is increasingly costly, and markets increasingly difficult to crack. So we must share the risks and the financing load.

[Question] What is your outlook as to future growth in SNIAS' civilian activities?

[Answer] What I should really like is to strike a sound balance between civilian and military business. The reason is that, what with the random factors to which we are exposed, our group must use product and market diversification to achieve the requisite balance of risks. There can be no question for a company like SNIAS of running a one-crop operation. And for that matter, this was the very reason why the company was formed in 1969: The rationale was that major aerospace ventures could be handled successfully only in cooperation.

Other countries have come to that same understanding, including Britain and the FRG, through a series of mergers leading to very large groups with international roots.

6182
CSO: 3698/375

FOKKER HOPES TO IMPROVE POSITION WITH NEW-GENERATION F-27, F-28

Huizen AARDE & KOSMOS in Dutch Mar/Apr 83 pp 178-179

/Text/ Recent reports of layoffs and shorter working hours underscore the fact that Fokker is having problems. The sales of new aircraft are sluggish at Fokker, as they are everywhere. The company hopes to change this with energetic efforts to improve the F-27 and F-28.

Last year was a troubled time for Fokker. We will review the major events and take a look at the immediate future.

Loss of Jobs

After Fokker had so optimistically entered into a cooperative relationship with the American company McDonnell-Douglas in 1981, the report came on 5 February 1982 that Fokker had pulled out of the agreement. In mid-1981, the two companies had forged a plan to put on the market by the mid-1980's the MDF-100, a 150-passenger jet aircraft with two engines. The cancellation of this ambitious project was not to cause immediate layoffs of personnel, which had then grown to a total of approximately 9,500 people, said Board Chairman Frans Swarttouw, who had just returned from the United States. When everyone, especially those directly affected, had recovered from the bad news, there followed a period of uncertainty among the personnel. Everybody must have asked: What now? This was reason enough for Swarttouw to visit all the Fokker plants shortly afterwards to speak with the workers. He stated that the world market had given no indication whatever that launching a program for a very advanced 150-passenger airplane was justified. The MDF-100 project had demanded so much energy and money of Fokker that standing programs had suffered from it. By withdrawing from the project, the company could give maximum attention to the improvement of the F-27 and F-28 and also leave open the possibility of participating in another 150-seater project on a small scale. The sequel to 1982 clearly showed that the cancellation of the MDF 100 project was a painful decision, but correct and valiant too.

After the future could be faced again with confidence, the earnings of the 1981 accounting year were made known. They revealed a continued increase in profits compared with the previous year. At that time, unfortunately, there were still no new orders for the F-27 and F-28. Not until mid-August, when the semiannual

company report for 1982 was made known, did the board of directors announce that orders had been placed for 24 airplanes of the F-27 and F-28 type. In spite of the unfavorable market situation, sales had risen by six percent. Net profits had climbed to 5,999 billion guilders, compared with 5,839 billion guilders for the first 6 months of 1981. These figures and the negotiations afoot with several clients for fleet replacement were sufficient cause for the board of directors to be optimistic at that time about the remainder of the year. There was even the expectation that the results of the second half of the year would be somewhat higher, although there was no revival in sight for the aviation industry.

The management had in the meantime ordered studies on additional development of both the F-27 and F-28. Months went by and the world aviation market was extremely weak because of the economic recession. In the beginning of November, the report was issued calling for the elimination of 1,400 jobs. It was also announced that the 1983 production schedule for F-27's was being cut from 23 to 16 units, but that there would be no changes for the F-28. Then Airbus made public its plan to lower production of all versions of the Airbus. This meant a reduction in Fokker's production of parts for Airbus Industry. Moreover, since the Dutch Government reduced by half its followup order of F-16's, structural measures had to be taken to eliminate the overcapacity that resulted. Negotiations began with the trade unions on 700 forced dismissals, compulsory early retirement for all employees 57.5 years of age and older (this affected 250 to 300 people) and a 7-day reduction in annual worktime.

By now, the news media will have announced how these talks turned out.

The F-27 Friendship

In 1982, Fokker delivered 14 F-27's and 9 F-28's. A look at the F-27 reveals that there is a kind of "buyers' strike" afoot. The cause of this lies in the economic recession and the worldwide crisis in aviation. This impacts doubly hard on the F-27 because both the airline companies and the governments have experienced dwindling investment capital or revenue sources. Future competition from, for example, the ATR-42 completely justifies Fokker's plans to modernize the F-27. Also, the F-27 is a quarter century old, and at least the power source (engines) and propellors could be engineered to be lighter, more modern and more efficient. A turboprop engine is needed with a shaft horsepower rating of about 2,200. There are presently two announced types: the new RB-517 engine to be developed by Rolls Royce in England and a version of the PW-100, already developed by Pratt & Whitney in the United States. The purpose of this comprehensive modification is of course the reduction of fuel consumption but also the lowering of the direct costs per seat. The F-27 could then stay competitive with the ATR-42 now being developed, the BAe ATP-748 and with small planes like the brand-new Saab-Fairchild 340.

Fokker is said to have already decided which engine manufacturer it will do business with. If all goes according to plan, the first F-27RE (RE for re-engining) can be delivered in 1987. Fokker also intends to offer past F-27 buyers the chance to exchange their present turboprop engines for the new engines.

Returning now to the present state of affairs, we see that Oman Aviation Services (OAS) was one of the customers in a situation to buy the last F-27's of 1982; it took delivery in early January last of an F-27 Mk-500, one of the four now in the OAS fleet, all of which are equipped to transport 52 passengers and have a large cargo door. They are used chiefly to serve the oil company Petroleum Development Oman (PDO). Oil fields can be located in xtremely inaccessible places, and Fokker has outfitted these units with special equipment enabling them to operate from sandstrips layed out nearby. OAS averages about 350 flights a month for PDO. Previously, OAS flew with three F-27 Mk-600's that belonged to Gulf Air.

The F-28 Fellowship

After the cancellation of the MDF-100, Fokker vigorously took up the studies on the development potential of the F-28. These call for an elongated F-28 for 100 passengers and are reminiscent of the Super F-28 that Fokker came out with a few years ago. That project eventually became the F-29 and was incorporated by Fokker into the MDF-100 project.

The Mk-4000 has furnished the starting point of the new project. It is the longest version of the F-28, providing room for up to 85 passengers. The new model is a clear attempt to offer a replacement for the obsolete small DC-9 and versions of the Boeing-737, which are scheduled to be removed from service toward the end of the 1980's by several airlines. If Fokker can design the F-28 to operate more economically than the secondhand DC-9's and 737's, it will without doubt enjoy success with its newest creation. Of course, a new engine will play a very important role in this. The Rolls Royce Tay, based on the RB-183, has been designed by Rolls Royce and will now go into the development stage. Negotiations are currently underway with U.S.-based Grumman to supply 200 Tays for the power systems of the brand-new Gulfstream-G.IV.

Board of directors Member J. Cornelis delivered a lecture in Madras, India, on 9 December 1982, in which he stated that the new F-28 was going by the code P-332 for the time being. In addition to the elongated fuselage designed to transport up to 109 passengers, the P-332 has a larger wingspan and a totally new nose. In comparison with the F-28 Mk-4000, this plane will be 25 percent more fuel efficient per seat mile and thus able to fly as economically as the much larger DC-9-80. If all goes according to plan, the go-ahead will be given by the middle of the year, and the first new F-28's could be turned over to customers by mid-1987.

Fokker delivered three of the nine F-28's last December. One of these was destined for Airlines of Western Australia (AWA). This unit was an Mk-4000 that can accommodate up to 85 passengers. AWA had it outfitted as a 75-seater for long-distance flights, mainly in the northern and western regions of Australia. In the middle of last year, AWA had been delivered an identical version of the F-28. Along with these two MK-4000's, the company also has seven Mk-1000's, a model that has been discontinued since 1976. AWA intends to replace these older models gradually. This is not so surprising, considering the fact that the Fellowships in the AWA fleet have recorded the most flying time of all F-28's: more than 32,000 hours per unit.

Linjeflyg, the Swedish regional airline, was delivered its 15th F-28 on 17 December, when the plane, an Mk-4000 equipped for 85 passengers, was flown over to the Bromma Airport in the heart of Stockholm. Also, as of 1 October 1983, Linjeflyg is slated to assume a new home base: the Arlanda Airport, located 40 kilometers from Stockholm. Linjeflyg has been flying the F-28 since 1973. The low cost levels and the good acoustical qualities persuaded the company at that time to choose the Dutch product. It is thus very possible that it will expand its fleet with F-28's. Linjeflyg is experiencing strong growth in both sales and profitability, stemming in part from a price policy designed to attract passengers outside of peak hours. Linjeflyg is enjoying miraculous success, a remarkable showing in times like these.

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TRANSPORTATION

DORNIER PUTS 'NEW TECHNOLOGY WING' ON AMPHIBIAN

First Flight Secret

Zurich NEUE ZUERCHER ZEITUNG in German 29 Jun 83 p 33

[Text] The initial flight was kept strictly secret by Dornier. It took place on 25 April on the plant airport in Oberpfaffenhofen at Munich, so to speak with exclusion of the public. The Do-24TT did not appear at the Paris Air and Space Exhibition in Bourget, disappointing many, predominantly older, visitors. On the one hand, Dornier did not want to take a risk at this early stage of flight testing and, on the other hand, the Do-24 should not be the carrier of nostalgic feelings, but a carrier of technology; consequently the designation Do-24TT.

In the meantime, the Do-24TT has behind it a good 20 flight hours, and the expectations for this experimental aircraft have up to now been fulfilled. Presumably in August, the Dornier 24TT will face a decisive test: It will fly to Kiel and will have to prove its seaworthiness in the Baltic.

Old Fuselage - New Wing

The construction of the Do-24 was instigated in 1935 by the Dutch Navy, which needed a modern long-distance seaplane for use in Indonesia, for many purposes - for remote reconnaissance, for emergency sea service, or as a transport aircraft. The initial flight took place in 1937. During the Second World War, the Do-24 proved itself in many respects. Before the end of the war, Germany delivered Do-24s to Spain in the year 1944. There they continued to be used until 1970. Then, Dornier could purchase back a Do-24. However, it was not accorded a peaceful life as a museum piece as had originally been anticipated. The old fuselage, to which seawater and corrosion had done remarkably little damage during the course of a quarter century, was thoroughly overhauled. On the other hand, the wings and propulsion system are completely new. As regards the wing, one took into account the aerodynamic shaping and the new technology of the support surfaces of the Do-228, with the propulsion system one decided in favor of three propeller turbines from Pratt and Whitney PP-6A-45, each with a power of 1125 HP (839 KW).

The Tasks

The objective of the experimental program comprises the following key points: increased capability under high seas compared to previously known seaplanes;

deployment flexibility on the basis of amphibian design; improvement of performance and economy in comparison to previous seaplanes and amphibious aircraft by novel aerodynamics and propulsion systems; testing a larger design of the new technology wing or airfoil, which was developed by Dornier, in a simplified construction mode, to reduce production costs, and finally the testing of modern propeller turbines for deployment on the high seas.

At this time, mass production is still far away. An amphibious aircraft with high-seas capability could undoubtedly be expected to have some demand. Indeed, it would be suitable for a wide spectrum of tasks; as an example, one need only mention the monitoring of fishing and national zones. Dornier has been leading for decades in the construction of seaplanes. Nevertheless, there are voices at Dornier who are skeptical about the current program.

New Wing, Materials Used

Stuttgart FLUG REVUE in German Jul 83 pp 66-67.

[Unattributed Article]

[Excerpts] The long-term objective is an economical amphibious aircraft that is suitable for all-weather: the technology carrier Dornier Do 24 TT, which is currently being flight tested, combines the advantages of conventional and new technology.

Building on the fuselage of a Do-24-T2, which was retired from service in Spain in 1971, a modern propeller turbine and new technology wings already successfully used in the Do 228, are to be used to investigate whether the amphibian aircraft, so frequently pronounced dead, does not still have a chance for the future.

The proven profile is characterized by low resistance both in climb and in cruise and by high maximum lift when the flaps are retracted or extended. The simple, rectangular wing received triangle wing tips, which were selected on the basis of wind tunnel measurements. A three-part single-slot Fowler flap extends between the ailerons over a total length of 17.8 meters at the trailing edge of the wing. Thus, calculations for a three-engine operation with a take-off weight of 12 tons, yielded a take-off of barely 300 meters with a runway take-off and less than 200 meters with a water take off. The old Do 24, a racially pure seaplane, needed almost twice as much "take-off run."

The main part of the technology carrier (TT) is the wing assembly which consists of the structure tested with the new-technology wing (TNT) and nine conventional Baldachin struts. The integral-machined, rectangular spar box consists of NC-machined panels with integrated ribs, stringers, spar flanges, and cross pieces for the spar connection. The spar webs are likewise NC-milled, and have integrated posts and hand holes for final assembly and for access to the fuel tank. Since many components are the same or similar, the wing can be produced economically.

In a number of wing components, glass- or carbon-fiber reinforced plastic were utilized. The 24 end box sections and the wing tips are made of carbon-fiber reinforced plastic/glass fiber reinforced plastic sandwich construction. The strut junction fairing between the struts and the lower side of the wing, the upper side of the fuselage and the landing gear fairings, the aileron and landing flap bearing arm jackets were all fabricated of glass-fiber reinforced plastic.

Only when flight tests are concluded and the results are promising, will Dornier think about utilization. In any case, demonstration flights are anticipated, which will provide information concerning the marketing possibilities of an amphibious aircraft.

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END